# Arithmetic Critters™

No. A-166
Instructional Computing Courseware
for Apple® II Series Computers

*for the love of learning*

mecc®

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Instructional Computing Courseware
for Apple® II Series Computers

*for the love of learning*™

mecc®

This manual is compatible

with

the ***Arithmetic Critters*** disk

Version 1.x

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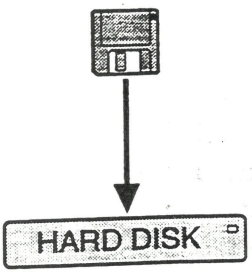
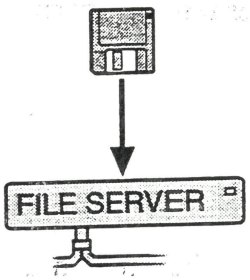
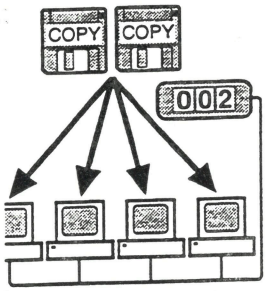
| |  |  |  |
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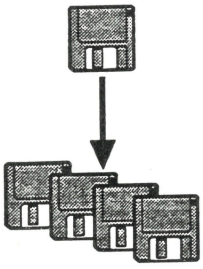
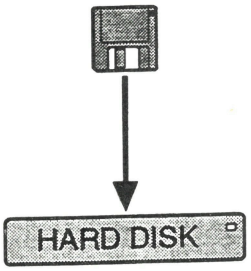
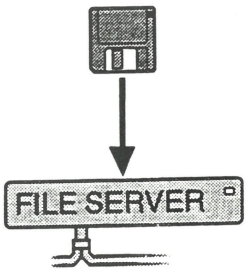
|  |   |   |
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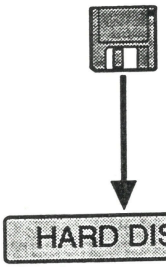
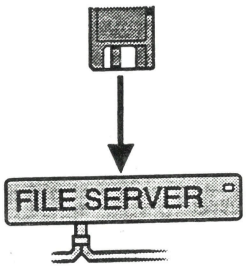
| |  |  |
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## TABLE OF CONTENTS


Introduction . . . . . 1

Programs

**ANIMAL ADDITION**

Description . . . . . 2
Learning Objectives . . . . . 2
Program Preview . . . . . 3
Use in an Instructional Setting . . . . . 4
Preparation . . . . . 4
Using the Program . . . . . 4
Follow-up . . . . . 4

**FOWL PLAY**

Description . . . . . 5
Learning Objectives . . . . . 5
Program Preview . . . . . 6
Use in an Instructional Setting . . . . . 7
Preparation . . . . . 7
Using the Program . . . . . 7
Follow-up . . . . . 7

**UNIT WORM**

Description . . . . . 8
Learning Objectives . . . . . 8
Program Preview . . . . . 9
Use in an Instructional Setting . . . . . 10
Preparation . . . . . 10
Using the Program . . . . . 10
Follow-up . . . . . 10

**EGG PLANT**

Description . . . . . 11
Learning Objective . . . . . 11
Program Preview . . . . . 12
Use in an Instructional Setting . . . . . 13
Preparation . . . . . 13
Using the Program . . . . . 13
Follow-up . . . . . 13

Appendices

A. Credits . . . . . 15

## INTRODUCTION

Arithmetic Critters is a collection of four programs designed to give kindergarten through second-grade children individual practice on early mathematics skills.

In ANIMAL ADDITION, students practice adding two groups of up to nine identical animals.

In FOWL PLAY, students practice subtracting one to nine birds from a group of up to eighteen birds.

UNIT WORM gives students practice measuring lengths and perimeters with caterpillars as the units of measurement.

In EGG PLANT, students practice writing numerals as they count from ten to ninety-nine boxes of eggs being shipped from an egg factory.

Management Options are available which allow you to modify the programs to meet the needs of your students. To access the Management Options, go to the main menu. While holding down the Control Key, type the letter A (Control-A). For complete instructions on using the Management Options, refer to the "Use in an Instructional Setting" sections of this manual.

You may turn the sound effects off **before** you begin a program by selecting Option 6 on the main menu, or you may turn them off **during** a program by holding down the Control Key and typing the letter S (Control-S).

Students may leave a program by pressing the Escape (Esc) Key twice anytime the program is waiting for a response.

To use Arithmetic Critters, you will need an Arithmetic Critters program diskette, a 64K Apple II series computer, a monochrome or color monitor, and a disk drive.

Arithmetic Critters is a product from the MECC Early Learning Series. This series presents opportunities for children to practice a wide variety of readiness skills. Additional products currently available include Counting Critters, First-Letter Fun, Fun from A to Z, and Paint with Words.

MECC's Mastering Math Series provides an excellent next step for students after they have used Arithmetic Critters. The first product in that series is Early Addition.

## DESCRIPTION

In ANIMAL ADDITION, students practice beginning addition by adding two groups of up to nine identical animals. Remedial feedback teaches students to solve the problem by counting the two groups. You can use the Management Options to modify the range of numbers used in the program.

| | |
|---|---|
| Curriculum Area: | Mathematics |
| Subject: | Arithmetic |
| Topic: | Addition |
| Type: | Drill and Practice |
| Reading Level: | Pre-reading |
| Grade Range: | Kindergarten - 1st Grade |
| Classroom Use: | Individual |

## LEARNING OBJECTIVES

After using this courseware, the student should be able to:

- add two groups of one to nine objects by counting;
- create a picture to illustrate simple addition problems;
- understand that addition is the process of putting two groups of identical items together (Number SELO, p. 122);*
- begin memorization of the basic facts of addition.

*Some Essential Learner Outcomes and Interaction Suggestions in Early Childhood Education, Curriculum Bulletin 58, Minnesota State Department of Education, 1978, St. Paul, Minnesota.

## PROGRAM PREVIEW

ANIMAL ADDITION shows two sets of identical animals and a corresponding problem for adding the two sets (Figure 1). Each set contains as many as nine animals. Note: Specifications set in the Management Options determine the numbers used.

Students get three chances to answer each problem. After they type their answer, they press the Return Key. If they answer correctly, an animated sequence appears at the bottom of the screen.

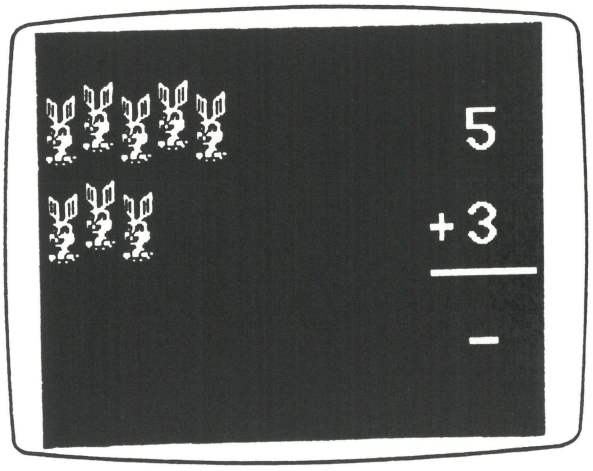


Figure 1

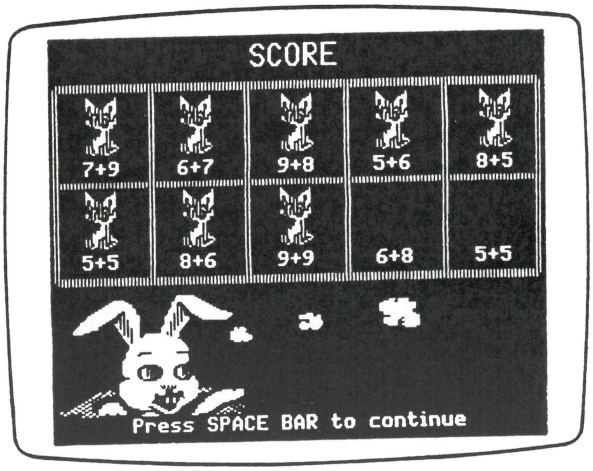


Figure 2

If students answer incorrectly, a slash is drawn through their answer. After the second incorrect answer, the animals in both the first and second sets flash one at a time. A note on an ascending scale is played when each animal flashes. On the third incorrect answer, the program numbers the animals on the screen as the ascending scale is played again. The correct answer then flashes.

When they have completed ten problems, students see a screen that shows their score (Figure 2). Ten boxes, each containing an addition equation, appear at the top. For each problem answered correctly on the first try, an animal appears in the box along with the equation.

## USE IN AN INSTRUCTIONAL SETTING

### Preparation

ANIMAL ADDITION is already set to present problems in which both addends are between 1 and 9 and the sums are between 2 and 10. If you want to change the addends or the sums, you can use the Management Options. To access the Management Options, go to the main menu. While holding down the Control Key, type the letter A (Control-A). Select the first option, "Modify Animal Addition," on the Management Options menu. You will see the Modify Animal Addition menu. Enter 1 to change the top numerals, 2 to change the bottom numerals, or 3 to change the sums.

Before students use the program, you should teach them to enter their answers by typing the answer and then pressing the Return Key. You should also inform students that they can press the Back-Arrow Key or the Delete Key to erase answers.

### Using the Program

You may wish to encourage students to touch each animal by placing their finger on the screen as they count them.

When students answer incorrectly, encourage them to count the animals as they flash or as they are numbered by the program.

### Follow-up

- Give students simple addition problems and have them draw objects to illustrate the problems.
- Have students create their own addition problems and draw simple objects to illustrate the numerals in their problems. Students can then exchange papers and solve each other's problems.
- Give students a group of identical objects (pencils, crayons, and so on) and have them create as many addition problems as they can by using the objects.

## DESCRIPTION

In FOWL PLAY, students practice beginning subtraction by subtracting as many as nine birds from a group of one to eighteen birds. You can use the Management Options to modify the range of numbers used in the program.

| | |
|---|---|
| Curriculum Area: | Mathematics |
| Subject: | Arithmetic |
| Topic: | Subtraction |
| Type: | Drill and Practice |
| Reading Level: | Pre-reading |
| Grade Range: | Kindergarten - 1st Grade |
| Classroom Use: | Individual |

## LEARNING OBJECTIVES

After using this courseware, the student should be able to:

- answer graphically represented subtraction problems by counting the difference (counting the remaining objects);
- create a picture to illustrate simple subtraction problems;
- begin memorization of the basic facts of subtraction.

## PROGRAM PREVIEW

In FOWL PLAY, students see from one to eighteen birds sitting in their nests. As many as nine of the birds leave their nests and disappear. The program presents a corresponding subtraction problem (Figure 1). Note: Specifications set in the Management Options determine the numbers used.

Students get three chances to answer each problem. After they type their answer, they press the Return Key. If they answer correctly, the birds salute with their wings or chirp.

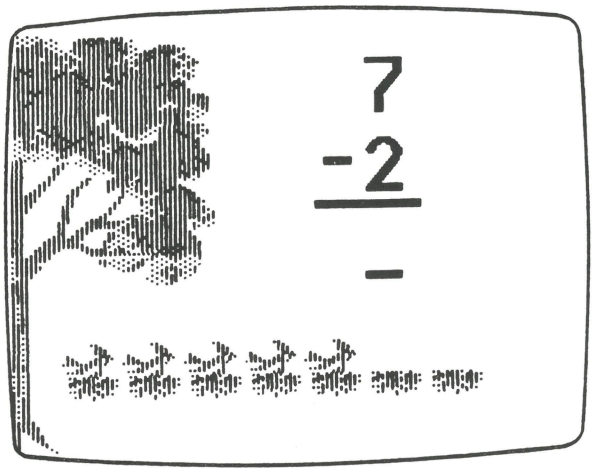


Figure 1

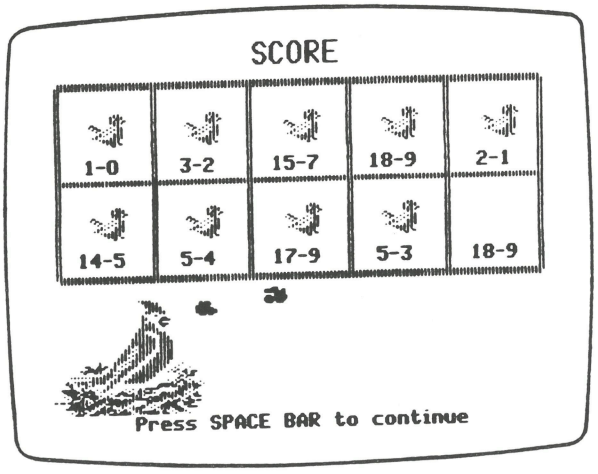


Figure 2

If students answer incorrectly, a slash is drawn through their answer. On the second incorrect answer, each of the birds flashes one at a time. A note on an ascending scale is played as each bird flashes. On the third incorrect answer, the program numbers the birds on the screen as the ascending scale is played again. The correct answer then flashes.

When they have completed ten problems, students see a screen that shows their score (Figure 2). Ten boxes, each containing a subtraction equation, appear at the top. For each problem answered correctly on the first try, a bird appears in the box along with the equation.

## USE IN AN INSTRUCTIONAL SETTING

### Preparation

FOWL PLAY is already set to present problems in which the top numeral (minuend) is between 1 and 18 and the bottom numeral (subtrahend) is between 1 and 9. The program is set to present problems with differences between 1 and 9. If you want to change the numerals or the differences, you can use the Management Options. To access the Management Options, go to the main menu. While holding down the Control Key, type the letter A (Control-A). Select the second option, "Modify Fowl Play," on the Management Options menu. You will see the Modify Fowl Play menu. Enter 1 to change the top numerals, 2 to change the bottom numerals, or 3 to change the differences.

Before students use the program, you should teach them to enter their answers by typing the answer and then pressing the Return Key. You should also inform students that they can press the Back-Arrow Key or the Delete Key to erase answers.

### Using the Program

One method of solving these subtraction problems is to count the remaining birds. If you teach your students this method, you may wish to encourage them to touch each bird by placing their finger on the screen as they count them.

When students answer incorrectly, encourage them to count the birds as they flash or as they are numbered by the program.

### Follow-up

- Give students simple subtraction problems and have them draw objects to illustrate the problems.
- Have students create their own subtraction problems and draw simple objects to illustrate the numerals in their problems. Students can then exchange papers and solve each other's problems.
- Give students a group of identical objects (pencils, crayons, and so on) and have them create as many subtraction problems as they can by using the objects.

## DESCRIPTION

In UNIT WORM, students use counting to measure lengths and perimeters. A caterpillar, or "unit worm," moves between two objects or around a box. Students measure the distance by counting the times the unit worm stretches out. You can use the Management Options to choose the size and speed of the unit worm, the type of drills, and the use of silhouettes.

| | |
|---|---|
| Curriculum Area: | Mathematics |
| Subject: | Measurement |
| Topic: | Length and Perimeter |
| Type: | Drill and Practice |
| Reading Level: | Pre-reading |
| Grade Range: | Kindergarten - 1st Grade |
| Classroom Use: | Individual |

## LEARNING OBJECTIVES

After using this courseware, the student should be able to:

- count units to determine the length or perimeter of an object;
- measure size in length, width, and thickness by using non-standard units (Number SELO, p. 122).*

*Some Essential Learner Outcomes and Interaction Suggestions in Early Childhood Education, Curriculum Bulletin 58, Minnesota State Department of Education, 1978, St. Paul, Minnesota.

## PROGRAM PREVIEW

In UNIT WORM, students see a caterpillar moving between two objects (drill on length) or around a box (drill on perimeter). Students count the number of caterpillar lengths (the times the caterpillar stretches out) to determine the length or perimeter (Figure 1). The size of the caterpillar (small, medium, or large), the speed at which it moves, and the type of exercises presented (drill on length or drill on perimeter) are controlled by the Management Options. The Management Options also determine whether a silhouette appears each time the caterpillar moves.

When the caterpillar stops moving, the students enter the measurement and press the Return Key. If they answer correctly, a butterfly appears and then flies away.

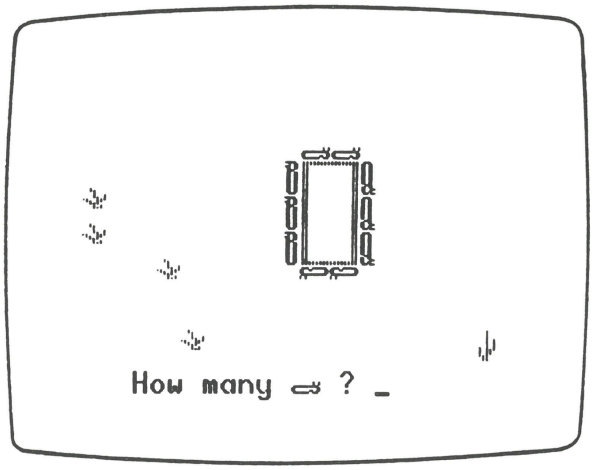


Figure 1

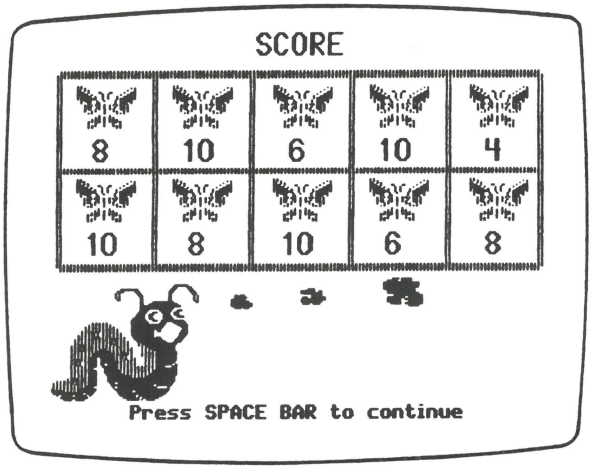


Figure 2

If students answer incorrectly, a slash is drawn through their answer. On the first incorrect answer, the silhouettes appear (if they are not already on the screen). On the second incorrect answer, the silhouettes flash one at a time. As each silhouette flashes, a tone is played on an ascending scale. After the third incorrect attempt, the program displays the correct answer and numbers the silhouettes.

When they have completed ten problems, students see a screen that shows their score (Figure 2). Ten boxes, each containing a measurement, appear at the top. For each problem answered correctly on the first try, a butterfly appears in the box along with the measurement.

## USE IN AN INSTRUCTIONAL SETTING

### Preparation

UNIT WORM is already set to drill length problems that are between one and six units long. The program is also set to use the large caterpillar at a medium speed. Each time the caterpillar moves, a silhouette appears. If you want to change any of these features, you can use the Management Options. To access the Management Options, go to the main menu. While holding down the Control Key, type the letter A (Control-A). Select the third option, "Modify Unit Worm," on the Management Options menu. You will see the Modify Unit Worm menu, which will allow you to select the feature you want to change.

Before students use the program, you should teach them to enter their answers by typing the answer and then pressing the Return Key. You should also inform students that they can press the Back-Arrow Key or the Delete Key to erase answers.

### Using the Program

You may wish to encourage students to touch each caterpillar by placing their finger on the screen as they count them.

When students answer incorrectly, encourage them to count the silhouettes as they flash.

When students are ready for additional challenges, you can use the Management Options to increase the program's level of difficulty in the following ways:

- You can increase the lengths and perimeters.
- You can vary the size of the unit worm.
- You can increase the speed of the unit worm.
- You can turn off the silhouettes, thus requiring students to pay closer attention as they count the unit worms.

### Follow-up

Give students sets of identical objects that they can lay end to end, such as paper clips. Have the students use these objects to measure the length of several other objects in the classroom.

## DESCRIPTION

EGG PLANT gives students practice writing numerals to represent between ten and ninety-nine objects. Students are shown one to nine trucks, each of which carries ten egg boxes. They also see another truck carrying as many as nine egg boxes. Students must provide the numeral that identifies the number of egg boxes. You can use the Management Options to modify the range of numbers drilled in the program and to modify the format of the remedial feedback.

| | |
|---|---|
| Curriculum Area: | Mathematics |
| Subject: | Numeration |
| Topic: | Ones and Tens Digits |
| Type: | Drill and Practice |
| Reading Level: | Pre-reading |
| Grade Range: | 1st - 2nd Grade |
| Classroom Use: | Individual |

## LEARNING OBJECTIVE

After using this courseware, the student should be able to:

- write the numerals that represent ten to ninety-nine objects.

## PROGRAM PREVIEW

In EGG PLANT, students see one to nine trucks, each containing ten boxes of eggs. Another truck, the last to appear, carries as many as nine egg boxes. Students must decide the total number of egg boxes on the trucks (Figure 1).

Students get three chances to answer each problem. After they type their answer, they press the Return Key. The first time students answer correctly, the chicken on top of the egg factory clucks and stands up. If the students get three consecutive answers correct, the chicken flutters off the nest and the eggs in the nest hatch.

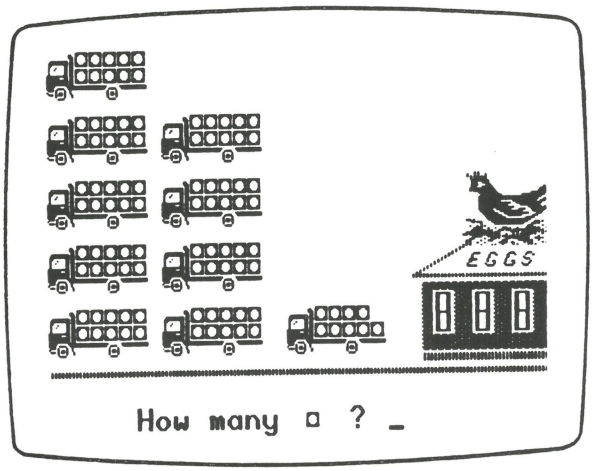


Figure 1

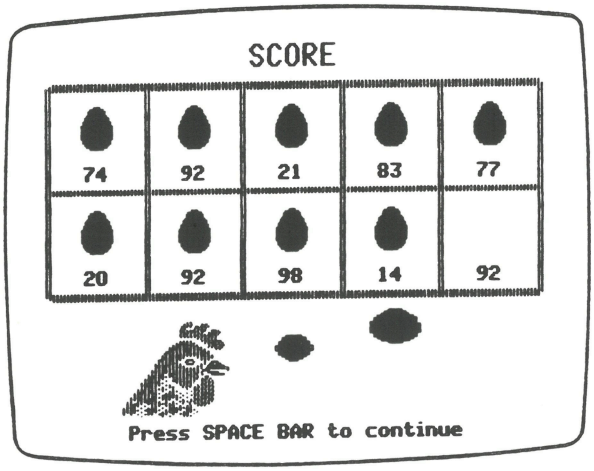


Figure 2

If students answer incorrectly, a slash is drawn through their answer. After the second incorrect answer, a thought cloud appears above the chicken. The program counts the number of trucks that contain ten boxes and displays that number next to the word "tens" in the thought cloud. The program then counts the number of boxes on the last truck and displays that number next to the word "ones." The thought cloud remains while students make their third attempt. If they answer incorrectly, the correct answer will appear in the thought cloud and in the answer blank at the bottom of the screen.

When they have completed ten problems, students see a screen that shows their score (Figure 2). Ten boxes, each containing a numeral, appear at the top. For each problem answered correctly on the first try, an egg appears in the box along with the numeral.

## USE IN AN INSTRUCTIONAL SETTING

### Preparation

EGG PLANT is already set to present problems that drill students on writing numerals from 10 to 99. Remedial feedback for incorrect answers is provided in a horizontal format (for example, "8 tens 5 ones"). If you want to change the numerals the program drills, you can use the Management Options to select different numerals between 10 and 99. You can also use the Management Options to change the format of the remedial feedback to a table format:

| tens | ones |
|---|---|
| 8 | 5 |

To access the Management Options, go to the main menu. While holding down the Control Key, type the letter A (Control-A). Select the fourth option, "Modify Egg Plant," on the Management Options menu. You will see the Modify Egg Plant menu. Enter 1 to change the range of numerals drilled in the program or 2 to change the remedial feedback format.

Before students use the program, you should teach them to enter their answers by typing the answer and then pressing the Return Key. You should also inform students that they can press the Back-Arrow Key or the Delete Key to erase answers.

### Using the Program

You may wish to encourage students to touch each truck or egg box by placing their finger on the screen as they count them.

When students answer incorrectly, encourage them to count the trucks and egg boxes as they flash and as they are numbered by the program.

### Follow-up

Give students a set of objects (such as popsicle sticks) that they can group into tens and ones. Have them provide the numeral that tells how many objects are in the set.

# APPENDICES

## CREDITS

Arithmetic Critters was produced by a MECC development team that included Rich Childers, Susan Gabrys, Robert J. Granvin, Charolyn Kapplinger, and Loren Sucher.

MECC wishes to extend a special thanks to the following teachers and their students for their assistance in developing this package: Edie Doerr, Island Lake Elementary School, Shoreview, Minnesota; and Karen Lindgren, Pinewood Elementary School, Mounds View, Minnesota.

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TO THE READER:

MECC has made every effort to ensure the instructional and technical quality of this courseware package. Your comments—as user or reviewer—are valued and will be considered for inclusion in any future version of the product. Please address comments to:

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